Mechanical Power Presses

WAC 296-806-455

Summary

- In addition to the requirements in this section, you need to refer to the following sections of this chapter in order to fully protect your employees from machine hazards:
  - Requirements for All Machines, WAC 296-806-200 and WAC 296-806-300

This section applies to mechanically powered machines that transmit force to cut, form, or assemble metal or other materials through tools or dies attached to or operated by slides.

Exemption:

- This section doesn't apply to:
  - Power press brakes
  - Hydraulic power presses
  - Pneumatic power presses
  - Slow-acting horizontal mechanical presses with large beds (bulldozers)
  - Hot bending and hot metal presses
  - Forging presses and hammers
  - Riveting machines
  - Cold headers and cold formers
  - Eyelet machines
  - High energy rate presses
  - Ironworkers and detail punches
  - Metal shears
  - Powdered metal presses
  - Press welders
  - Turret and plate punching machines
  - Wire termination machines
  - Welding presses

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Summary

Reference:

- See Forging Machines for forging press and hammer requirements, WAC 296-806-430.
- See Ironworkers for requirements for ironworkers, WAC 296-806-445.
- See Press Brakes for power press brake requirements, WAC 296-806-465.

YOUR RESPONSIBILITY

To make sure mechanical power presses meet the requirements of this section

You must

DESIGN AND CONSTRUCTION

SAFEGUARDING

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WAC 296-806-455

Summary

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Summary

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Rule

DESIGN AND CONSTRUCTION

WAC 296-806-45502

Make sure mechanical power presses are properly designed and constructed

You must

- Make sure mechanical power presses manufactured **before** January 1, 2005, meet the requirements of American National Standards Institute (ANSI) B11.1-1971, Safety Requirements for the Construction, Care, and Use of Mechanical Power Presses.
- Make sure mechanical power presses manufactured, reconstructed, or modified **on or after** January 1, 2005, meet the requirements of ANSI B11.1-2001, Safety Requirements for Mechanical Power Presses.

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Rule

SAFEGUARDING

WAC 296-806-45504

Safeguard presses that use unitized tooling

You must

- Safeguard the opening between the top of the punch holder and the face of the slide or striking pad by using properly installed, adjusted, and maintained guards or devices.

WAC 296-806-45506

Protect operators from guidepost hazards

You must

- Use properly installed, adjusted, and maintained guards or devices to protect operators from the hazards created by:
  - Guideposts separating from their bushings
  - Similar pinch points between the slide (moving die) and fixed die or press attachments

Exemption:

- This requirement doesn't apply if the opening is ¼ inch or less, before use.

WAC 296-806-45508

Safeguard the point of operation

You must

- Protect employees from point-of-operation hazards by using properly installed, adjusted, and maintained guards or devices.

Exemption:

- This requirement doesn't apply if the point-of-operation opening is ¼ inch or less, before use.

Note:

- ➢ You may use a combination of guards and devices as long as employees are completely protected from point-of-operation hazards.
- ➢ Hand tools used for placing materials into the press, or removing them from the press, aren't a substitute for point-of-operation guards or devices.

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WAC 296-806-455

Rule

WAC 296-806-45510

Make sure point-of-operation guards are properly designed and constructed

You must

- Make sure each guard:
  - Prevents the operator's hands or other body parts from reaching through, over, under, or around the guard into the point of operation.
  - Has no opening larger than the maximum permissible openings shown in Table 200-1, Largest Allowable Guard Openings, WAC 296-806-20042.
  - Doesn't create a pinch point between the guard and moving machine parts.
  - Uses fasteners that can't be easily removed by the operator.
  - Is easy to inspect.
  - Provides the best view of the point of operation for the type of work.

WAC 296-806-45512

Make sure barrier guards meet these requirements

You must

- Make sure a fixed barrier guard is attached to a fixed surface such as the stripper, die shoe, press frame, or bolster plate.
- Make sure the interlocked barrier guard:
  - Is attached to a fixed surface such as the press frame or bolster plate
  - Prevents cycling (stroking) of the press when the interlocked section of the guard isn't in the protecting position
  - Can't open until hazardous motion of the slide has stopped
- Not use the hinged or movable sections of an interlocked barrier guard for manual feeding.
- Make sure an adjustable barrier guard is:
  - Attached to a fixed surface such as the press frame, bolster plate, or die shoe
  - Adjusted only by authorized persons who can apply Table 200-1, Largest Allowable Guard Openings, WAC 296-806-20042.

Reference:

➢ See, Provide additional safeguards when the operator puts one or both hands into the point of operation, WAC 296-806-45526, for additional safeguards that are required if the operator puts one or both hands into the point of operation to feed or remove parts, and the point of operation is protected by a Type B gate or movable barrier device.

Mechanical Power Presses

WAC 296-806-455

Rule

WAC 296-806-45514

Make sure point-of-operation devices are effective

You must

- Make sure point-of-operation devices protect the operator from hazards as shown in Table 455-1, Point-of-Operation Devices.
- Make sure the motor start button is protected against accidental contact.

Table 455-1
Point-of-Operation Devices

Type of Device	Type of Operator protection that must be provided
Presence-sensing device (part-revolution clutch press)	If the operator's hands or other body part are in the point of operation: • Prevents initiating a press cycle (stroke) **or** • Stops the press during the closing portion of the cycle (stroke)
Presence-sensing device (full-revolution clutch press)	Do **not** use for point-of-operation safeguarding
Pull-back device	As the die closes: • Withdraws the operator's hands if they are located in the point of operation **or** • Prevents the operator from reaching into the point of operation
Restraint (holdout) device	Prevents the operator from reaching into the point of operation at all times
Two-hand control device Two-hand trip device	• Requires operators to use both hands to activate controls that are far enough away from the point of operation so the slide completes the closing portion of the cycle (stroke) or stops before they can reach into the point of operation
Type A gate or movable barrier device	Encloses the point of operation: • Before a press cycle (stroke) can be initiated **and** • Remains closed until slide motion has stopped
Type B gate or movable barrier device	Encloses the point of operation: • Before a press cycle (stroke) can be initiated **and** • Remains closed until slide motion has stopped during the closing portion of the cycle (stroke)
Sweep device	Do **not** use for point-of-operation safeguarding

WAC 296-806-45516

Make sure presence-sensing devices used to safeguard the point of operation meet these requirements

You must

- Make sure the presence-sensing device is interlocked into the control circuit to prevent or stop slide motion if the operator's hand or other body part is within the sensing field of the device during the down stroke of the press slide.
- Make sure muting of the device is done only during the upstroke of the press slide.
- Make sure failure of **any** component of the device:
  - Doesn't prevent normal stopping action of the press
  - Prevents initiation of another cycle (stroke) until corrected
  - Is indicated by the system
- Use guards to protect all areas of entry to the point of operation not protected by the presence-sensing device.
- Make sure the sensing field of the device is located farther from the point of operation than the minimum safety distance as determined by the following formula:

D = 63 X T

Where:
D = minimum safety distance (in inches)
T = stopping time of the press measured at approximately the 90 degree position of crankshaft rotation (in seconds)

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WAC 296-806-455

Rule

WAC 296-806-45516 (Continued)

Example:

The number in the formula represents the hand speed of the operator (63 inches per second). If your press has a stopping time of 1/2 seconds (.5 seconds), the calculations would be:

D = 63 X .5 = 31.5

The sensing field would need to be at least 31-½ inches from the point of operation.

Reference:

- See, Provide additional safeguards when the operator puts one or both hands into the point of operation, WAC 296-806-45526, while feeding or removing parts, for additional safeguards that are required if the operator puts one or both hands into the point of operation to feed or remove parts, and the point of operation is protected by a presence-sensing device.

WAC 296-806-45518

Make sure pull-back devices used to safeguard the point of operation meet these requirements

You must

- Make sure presses requiring more that one operator have a separate pull-back device for each operator.
- Make sure each pull-back device has attachments:
  - For each of the operator's hands
  - That are connected to and operated only by the press slide or its attached die
  - That are adjusted to either:
    - Prevent the operator from reaching into the point of operation
      or
    - Withdraw the operator's hands from the point of operation before the dies close
- Check each pull-back device that's being used for proper adjustment at these times:
  - At the start of each operator shift
  - After a new die set-up
  - When operators are changed
- Complete necessary maintenance or repair work before operating the press.

Reference:

➢ For recordkeeping requirements for maintenance or repair work, see Inspect and maintain presses, WAC 296-806-45540.

Mechanical Power Presses

WAC 296-806-455

Rule

WAC 296-806-45520

Make sure restraint (holdout) devices used to safeguard the point of operation meet these requirements

You must

- Make sure presses requiring more than one operator have separate restraint devices for each operator.
- Make sure each restraint device has attachments:
  - For each of the operator's hands
  - That are securely anchored
  - That are adjusted so the operator can't reach into the point of operation

WAC 296-806-45522

Make sure two-hand control devices used to safeguard the point of operation meet these requirements

You must

- Make sure presses that require more than one operator:
  - Have separate two-hand controls for each operator
  - Need concurrent application of all operators' controls to activate the slide
- Make sure the slide stops if any operator's hand's removed from a control button.
- Make sure two-hand controls are fixed in position and can be moved only by authorized persons.
- Make sure the controls are located farther from the point of operation than the minimum safety distance as determined by the following formula:

D = 63 X T

Where:
D = minimum safety distance (in inches)
T = stopping time of the press measured at approximately the 90 degree position of crankshaft rotation (in seconds)

Example:

The number in the formula represents the hand speed of the operator (63 inches per second). If your press has a stopping time of $^1/_2$ second (.5 second), the calculations would be:

D = 63 X .5 = 31.5

The controls would need to be at least 31-½ inches from the point of operation.

Reference:

➢ See Provide additional safeguards when the operator puts one or both hands into the point of operation, WAC 296-806-45526, for additional required safeguards.

Mechanical Power Presses

WAC 296-806-455

Rule

WAC 296-806-45524

Make sure two-hand trip devices used to safeguard the point of operation meet these requirements

You must

- Make sure presses requiring more than one operator:
  - Have separate two-hand trips for each operator
  - Need concurrent application of all operators' controls to activate the slide
- Make sure the two-hand trips are fixed in position and can be moved only by authorized persons.
- Make sure the controls are located farther from the point of operation than the minimum safety distance as determined by the following formula:

D = 63 X T

Where:
D = minimum safety distance (in inches)
T = the maximum time the press takes for the die to close after the press has been tripped (in seconds)

Example:

The number in the formula represents the hand speed of the operator (63 inches per second). If your press has a die closing time of $^1/_2$ second (.5 second), the calculations would be:

D = 63 X .5 = 31.5

The trip device would need to be at least 31½ inches from the point of operation.

Mechanical Power Presses

WAC 296-806-455

Rule

WAC 296-806-45526

Provide additional safeguards when the operator puts one or both hands into the point of operation

IMPORTANT:

- This rule applies when the operator puts one or both hands into the point of operation to feed or remove parts, and the point of operation is protected by any of the following:
  - Presence-sensing device
  - Two-hand control
  - Type B gate or movable barrier device

You must

- Make sure the press has both a:
  - Stopping-performance monitor (previously called brake-system monitor) **and**
  - Control system that monitors the performance of safety-related functions (previously called control reliability)
- Make sure the stopping-performance monitor meets the requirements of:
  - American National Standards Institute (ANSI) B11.1-1982, Mechanical Power Presses - Safety Requirements for Construction, Care, and Use for presses manufactured **before** January 1, 2005
  - ANSI B11.1-2001, Safety Requirements for Mechanical Power Presses for presses manufactured **on or after** January 1, 2005

Mechanical Power Presses

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WAC 296-806-455

Rule

WAC 296-806-45526 (Continued)

You must

- Make sure the control system monitors the performance of safety-related functions so that failure of any component in the control system:
  - Doesn't prevent normal stopping action of the press
  - Prevents initiation of another cycle (stroke) until the failure is corrected
  - Can be detected by a simple test or is indicated by the control system

Exemption:

- This requirement doesn't apply to control system components that don't affect protection from point-of-operation hazards.

Definition:

The *control system* includes the sensors, manual input and mode selection elements, interlocking and decision-making circuitry, and output elements of the press-operating devices and mechanisms.

OPERATIONS

WAC 296-802-45528
Establish die setting procedures

You must

- Develop and use procedures to protect employees from the hazards of die setting.
- Make sure die setters are provided with at least the following information:
  - Rated press capacity requirements for the die
  - Weight of the upper die and other slide attachments required for job setup and setting counterbalance air pressure
  - Total die weight

Note:

➢ This information may be stamped on the die or kept in a file that's readily available to the die setters.

Mechanical Power Presses

WAC 296-806-455

Rule

WAC 296-802-45530

Handle dies safely

You must

- Make sure dies requiring mechanical handling have handling equipment attachment points.
- Use die stops or other means to prevent losing control of the die while setting or removing dies from presses that are inclined.
- Make sure the upper and lower shoes will securely mount the die to the bolster and slide.
- Use additional means of securing the upper shoe to the slide where clamp caps or set screws are used in conjunction with punch stems.
- Make sure spring- loaded turnover bars are provided for presses designed to accept them.

WAC 296-802-45532

Protect die setters during setup and tryout

You must

1) Use safety blocks when an employee has to put their hands or other body part into the point of operation to adjust or repair dies.
2) Protect die setters doing die tryout from point-of-operation hazards by **at least one** of the following:
    - Properly installed, adjusted, and maintained guards or devices
    - Proper use of INCH mode (part-revolution clutch press)
    - Proper use of JOG mode (full-revolution clutch press)

WAC 296-806-45534

Train press operators

You must

1) Train operators to safely operate the press.
2) Make sure modified or reconstructed presses have instructions to establish new or changed guidelines for use and care of the press.

WAC 296-806-45536

Operate mechanical power presses safely

You must

- Operate the press within the manufacturer's rated capacities.

Note:

- Rated capacities include, but aren't limited to:
  - Structural capacity
  - Torque capacity
  - Energy capacity
  - Thermal capacity
  - Attachment weight
  - Die shutheight

Mechanical Power Presses

WAC 296-806-455

Rule

WAC 296-806-45538

Provide tools and other means to protect press operators

You must

- Make sure hand tools are provided and used to free and remove workpieces or scrap stuck in the die.
- Provide means for handling scrap from roll feed or random length stock operations.
- Provide and use means to keep operators and die setters from reaching into the point of operation or other hazard area to lubricate material or die components.

Note:

- Means for lubricating include, but aren't limited to:
  - Brushes
  - Swabs
  - Lubricating rolls
  - Manual spray systems
  - Automatic spray systems
- Handles on brushes or swabs should be long enough to keep persons using them clear of the point of operation.

WAC 296-806-45540

Inspect and maintain presses

You must

1) Make sure maintenance personnel are trained and competent to inspect and maintain power presses.
2) Keep records of all maintenance or repair work.
3) Inspect and test the following press systems **at least** weekly:
   - Clutch/brake mechanism
   - Antirepeat feature
   - Single stroke mechanism
   - Keep records of inspections and tests

Exemption:

- You don't have to do weekly inspections if your press has both:
  - Performance of safety-related functions monitoring (previously called control reliability)
    and
  - A stopping-performance monitor (previously called brake-system monitor) doesn't require weekly inspections

Reference:

➢ For requirements for these monitoring devices, see Provide additional safeguards when the operator puts one or both hands into the point of operation, WAC 296-806-45526.

Mechanical Power Presses

WAC 296-806-455

Rule

WAC 296-806-45542

Make sure presses and operating practices used in the PSDI (Presence Sensing Device Initiation) mode of operation meet these requirements

You must

- Make sure presses and operating practices used in the PSDI mode meet the requirements of 29 CFR 1910.217(h), Presence Sensing Device Initiation (PSDI).

Note:

- 29 CFR 1910.217(h) contains requirements for certification and validation of mechanical power presses used in the PSDI mode of operation.